



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: **Akira MATSUDA et al.**

Group Art Unit: **1775**

Serial Number: **10/719,020**

Examiner: **Robert R. Koehler**

Filed: **November 24, 2003**
9168

P.T.O. Confirmation No.:

For: **PLATING BATH FOR FORMING THIN RESISTANCE LAYER, METHOD OF FORMATION OF RESISTANCE LAYER, CONDUCTIVE BASE WITH RESISTANCE LAYER, AND CIRCUIT BOARD MATERIAL WITH RESISTANCE LAYER**

Attorney Docket No.: **032130**

Customer Number: **38834**

DECLARATION UNDER 37 CFR §1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

March 5, 2006

Sir:

I, Akira Matsuda, hereby declare and state that:

I am familiar with the contents of the United States Patent Application Serial No. 10/719,020, filed on November 24, 2003, claiming the priority of Japanese Patent Application No. 2002-341813 filed on November 26, 2002.

I am one of the inventors of the invention of the above-identified application.

I have studied the contents of the cited references.

To show the superiority of the present invention, I have conducted experimental tests.

I prepared samples as Comparative Examples 3 and 4 and evaluated them in the same manner as described in the specification at pages 13 to 20, as explained below.

(i) Preparation of Samples

Electrolytic copper foils as a conductive base were immersed in 1:1 hydrochloric acid (35%) water at ordinary temperature for 3 minutes, which were then plated with a resistance layer. The pH of the plating bath was adjusted using sulfamic acid or NaOH depending on the pH value. The electrolytic copper foils having a thickness of 18 μ m and a roughened matte surface of a roughness Rz of 2.1 μ m were used to mask the whole of the shiny surface and to partially mask the matte surface with leaving a 10 x 10 cm² opening. A platinum plated titanium sheet having a surface area of 1.5 dm² was used to form an anode. Then, the matte surface was plated in the following baths.

(a) Comparative Example 3

Nickel sulfamate:	150 g/L
H ₃ BO ₃ :	35 g/L
H ₃ PO ₄ :	50 g/L
H ₃ PO ₃ :	40 g/L
Bath temperature:	65°C
Current density:	15 A/dm ²
Time:	30 sec

	pH:	1.0
(b)	Comparative Example 4	
	Nickel sulfamate:	50 g/L
	H ₃ BO ₃ :	35 g/L
	H ₃ PO ₄ :	50 g/L
	H ₃ PO ₃ :	40 g/L
	Bath temperature:	65°C
	Current density:	15 A/dm ²
	Time:	30 sec
	pH:	1.0

Then, evaluation of the unevenness of the plating appearance was carried out, as well as measurement of the amount of nickel electrodeposition (mg/dm²) as plating thickness, the content (%) of phosphorus, and the resistance was made, after forming a circuit.

The results are shown in the Table below.

Table

	Comp. 1	Comp. 3	Comp. 4
Uniform appearance	Poor	Poor	Poor
Average P%	17.3	14.0	12.2
Average thickness	1.3	3.5	2.6
36P%	13.0	16.0	17.0
36thickness	11.0	9.0	10.0
Average resistance (. /mm ²)	100.0	60.0	78.0
36 resistance	26.0	20.0	23.0

I have found an error in Table 1 at page 18 of the specification. The 36 resistance value for Comparative Example 1 should have been "26.0," instead of "6.0." The error occurred in the

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preparation of the English specification, without deceptive intent. The number of "26.0" of the 36 resistance for Comparative Example 1 is listed in the priority Japanese Application No. 2002-341813 filed on November 26, 2002.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under the laws of the United States and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Akira Matsuda

Akira Matsuda

March, 5, 2006

Date